The Prevention of Phase Cancellation in Multiple-Frequency Concurrent Fiber-Optic Signal Transmission Via Photon Axis-Spin Alternation of Non-Polarized Light

16 October 2023
Simon Edwards
Research Acceleration Initiative

Introduction

In the quest to increase the rate of data transmission over existing fiber-optic cables, many attempts have been made to attempt to transmit data optically at multiple frequencies concurrently. These efforts have failed as no mechanism for overcoming the phase-cancelling interference effects of the disparate signals has been promulgated.

While adding a dimension of amplitude modulation to a signal (requiring retooling of switching mechanisms at the ISP level) as well as the previously published concept of taking advantage of the space in the walls of the fibers themselves in order to send data on parallel pathways using an electrically inductive system of transmission (requiring a top-down redesign of all fiber-optic infrastructure) the possibility of sending data via light of multiple frequencies simultaneously cannot be entirely discounted as yet another potential avenue for increasing overall bandwidth. These methods, if used in combination, would provide the greatest possible overall benefit.

Abstract

Phase cancellation is based upon the cumulative effect of magnetism of waves of photons both passing within close proximity and opposition to one another. Given enough opportunities (as in the echo chamber of a fiber-optic cable,) waves of light of different frequencies will, before long pass nearly enough to one another for the signal to be distorted and degraded through this interaction. The extent to which this occurs is the product of the amplitude of the two (or more) combined waves multiplied again by the proximity of those waves.

The strength of this effect is greater for light of higher amplitude and lesser for light of lower amplitude. In order for light to continue to be detectable upon arrival at a relay, however, given that the amplitude reduction needed to mitigate the phase cancellation effect sufficiently would prohibit an intact signal from traveling the requisite distance through a fiber-optic cable, transmitting light at ultra-low amplitude is not an option. Thus, an alternative method for mitigating this interference is called for.

In the case of data transmission through fiber-optics, we are seeking to prevent phase-cancellation events. While clever combinations of polarity-control and phase-control have been suggested by others which require ideal, laboratory conditions to work, they have not been demonstrated as effective in practice.

Attempting to shepherd two frequencies of light with two, distinct polarities over distances of hundreds of miles within a fiber-topic cable is untenable for reason of imperfections in the structure of the fibers themselves.

It is, however, possible to introduce repeated, transient alterations to the axis spin of photons of non-polarized light as they travel through a fiber-optic cable in order to mitigate the magnitude of interference events when they transpire by taking an action that temporarily negates the magnetic moment of the light by precluding alignments of spinning photons. As these interference events' magnitudes are determined by the alignment the magnetic moments of individual photons, if these alignments could be disturbed in a particular fashion, it would be possible to prevent phase-cancellation events without creating a lasting signal distortion.

This may be achieved by transmitting signals through fiber-optic cables with a novel feature in a core strand that runs through the center of the hollow space through which light is customarily transmitted. This core strand would not change the general mode of function of the cable nor interfere with the normal function of existing switching mechanisms at relays. Both the core strand and the walls of the primary fibers would contain components that exert magnetic influence in concert with one another.

The magnetism exerted by the materials composing both the wall and the core strand would be oriented so as to impose an axis-spin tilt of either a left-tilt or a right-tilt. This can be achieved by focusing narrow, weak magnetic fields toward specific spatial points that are offset by distances equal to the average spacing between photons in the medium (this will vary depending upon the intensity of the light and must be a known quantity in order to know how to space the magnetic field lines.) These magnetic field lines would not serve to distort the frequency of the light transmitted by dint of the way in which their own influence is self-cancelling. In a light wave, if every other photon were to have its spin angle (to put it into aviation terms: Angle of attack) offset to the left or right by even the slightest amount, although its frequency and angular momentum would be unchanged, the overall magnetic moment of the light wave would be effectively nullified so long as the individual photons could be repeatedly nudged into these "cockeyed" orientations.

If magnetism could be introduced that was sufficiently weak and sufficiently narrow in its focus by the very walls of fiber-optic cables and by a specialized core strand working in conjunction with magnetically active walls, it should be possible to actively mitigate the overall effective magnetic output of light waves without distorting those light waves. Once this is accomplished, it should be possible to transmit light of varying frequencies in parallel through a fiber-optic cable without any polarity-uniforming process whatsoever.

Conclusion

The ability to transmit data at multiple optical frequencies concurrently would exponentiate current capabilities and significantly alter the state of the art.